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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,499	11/19/2003	Ryuichi Kojima	117804	4501

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EXAMINER	
NGUYEN, LAMSON D	
ART UNIT	**PAPER NUMBER**
2861	

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/715,499	KOJIMA ET AL.	
	Examiner	Art Unit	
	Lamson D. Nguyen	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment dated 02/15/06*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 17-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 7-11, 13-15, and 17-20* is/are rejected.

7)☒ Claim(s) *6 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 4, and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by Bates et al. (6,923,521).

Bates et al teach an inkjet printhead comprising:

Claim 1:

- a plurality of ejectors that are two-dimensionally arranged such that when dots of the droplets ejected on a recording medium are viewed in a main scanning direction, which is orthogonal to the main scanning direction, the sizes of dot diameters are changed at random (figure 3 teaches a printhead 26 with a plurality of nozzles; figure 11 teaches large drops represented by large circles are disposed in a random fashion)

Claim 2:

- a plurality of ejectors that are two-dimensionally arranged such that when the ejectors are viewed in order in the main-scanning-orthogonal

direction, positions of the ejectors in the main scanning direction alternate in an offsetting manner, such that sizes of dot diameters of droplets from the plurality of ejectors is changed at random (figure 3 teaches large nozzles and small nozzles are offset in an alternating fashion; figure 11)

Claim 4:

- the offsetting alternation of the position of the ejector in the main scanning direction occurs at each ejector (figure 3 teaches all the nozzles are offset in the main scanning direction)

Claim 19:

- a droplet ejecting head (figure 3)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of Anderson et al (6,742,866).

Bates teaches all claimed features of the invention except:

- the spatial frequency of offsetting of alternation of the position of the ejector in the main scanning direction is in a range of 2.5 to 254 um

It is well-known in the art of inkjet printers to have offsetting nozzles in the main scanning direction when viewed in the main-scanning orthogonal direction in the range of 2.5 to 254 um, as taught by Anderson (figure 3a teaches nozzle 320 is offset from nozzle 160 by 1/600 which translates to 41.6 um).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Bates to incorporate the teaching of nozzle offset of 41.6m taught by Anderson for the purpose of achieved improved printing resolution.

Claims 5, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bates in view of Morikawa et al (6,595,614).

Bates teaches all claimed features of the invention except:

- (claim 5) the ejectors are divided, in the main scanning direction, into k ejector blocks, each ejector block includes at least one ejector unit includes n ejectors adjacent in the main scanning direction, the ejectors of each ejector unit are offset from each other in the main scanning-orthogonal direction

- (claim 7) wherein one ejector unit of one ejector block is offset in the main scanning-orthogonal direction
- (claim 9) wherein the n is an odd number

Meanwhile, Morikawa et al teach:

- (claim 5) the ejectors are divided, in the main scanning direction, into k ejector blocks, each ejector block includes at least one ejector unit includes n ejectors adjacent in the main scanning direction, the ejectors of each ejector unit are offset from each other in the main scanning-orthogonal direction (figure 3 teaches 4 nozzle blocks 35a-d, each block has a plurality of nozzles 36 that are offset to each other in the main-scanning direction).
- (claim 7) wherein one ejector unit of one ejector block is offset in the main scanning-orthogonal direction
- (claim 9) wherein the n is an odd number (figure 3 teaches 4 ejector blocks each block comprises 1 unit of 35a, 35b, 35c, and 35d)

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Bates to incorporate the teaching of claims 5, 7, and 9 taught by Morikawa for the purpose of incrementing line feeds.

Bates also does not teach:

- (claim 5) the the ejectors of two adjacent blocks are offset by pxk
- (claim 7) the ejector unit is offset to another unit in the main scanning orthogonal direction by p

It is well-known in the art of inkjet printers to have ejectors in adjacent blocks to be offset and adjacent ejector units to be offset.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Morikawa to have ejectors in adjacent blocks to be offset by p x k and adjacent ejector units to be offset by p for the purpose of increasing resolution, since it has been held to be within the general skill of a worker in the art that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 10-11, 13, 15, 17-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa in view of Bates and Anderson.

Morikawa teaches an inkjet head comprising:

Claim 10:

- a plurality of ejectors which are two-dimensionally arranged, wherein the ejectors are arranged such that when the ejectors are viewed in order in a main-scanning orthogonal direction, two ejectors adjacent in the main scanning direction are prevented from being adjacent to each other in the main (figure 2.2 or figure 3)

Claim 11:

- the ejectors are divided, in the main scanning direction, into k ejector blocks, each ejector block includes at least one ejector unit includes n ejectors adjacent in the main scanning direction, the ejectors of each ejector unit are offset from each other in the main scanning-orthogonal direction (figure 3 teaches 4 nozzle blocks 35a-d, each block has a plurality of nozzles 36 that are offset to each other in the main-scanning direction).

Claim 13:

- the ejectors are divided, in the main scanning direction, into k ejector blocks, each ejector block includes at least one ejector unit includes n ejectors adjacent in the main scanning direction, the ejectors of each ejector unit are offset from each other in the main scanning-orthogonal direction (figure 3 teaches 4 nozzle blocks 35a-d, each block has a plurality of nozzles 36 that are offset to each other in the main-scanning direction).

Claim 15:

- wherein the n is an odd number (figure 3 teaches 4 ejector blocks each block comprises 1 unit of 35a, 35b, 35c, and 35d)

Claim 20:

- a droplet ejecting head (figure 3)

However, Morikawa does not teach:

- (claim 10) the spatial frequency of offsetting of alternation of the position of the ejector in the main scanning direction is in a range of 2.5 to 254 um, and wherein the ejectors are arranged such that, when dots of the droplets ejected on the recording medium are viewed in a main scanning direction, the sizes of dot diameters are changed at random
- (claim 11) the the ejectors of two adjacent blocks to be pxk
- (claim 13) the ejector unit is offset to another unit in the main scanning orthogonal direction by p
- (claims 17-18) wherein the ejectors are arranged such that, when dots are viewed in a main scanning-orthogonal direction, densities of the dots are fluctuated up and down at each dot and a cycle of the fluctuation is pxk

Meanwhile, Bates teaches a plurality of ejectors that are two-dimensionally arranged such that when dots of the droplets ejected on a recording medium are viewed in a main scanning direction, which is orthogonal to the main scanning direction, the sizes of dot diameters are changed at random

(figure 3 teaches a printhead 26 with a plurality of nozzles; figure 11 teaches large drops represented by large circles are disposed in a random fashion).

It is well-known in the art of inkjet printers to have offsetting nozzles in the main scanning direction when viewed in the main-scanning orthogonal direction in the range of 2.5 to 254 um, as taught by Anderson (figure 3a teaches nozzle 320 is offset from nozzle 160 by 1/600 which translates to 41.6 um).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Morikawa to incorporate the teaching of nozzle offset of 41.6m taught by Anderson for the purpose of achieved improved printing resolution and randomly changed dot sizes taught by Bates for the purpose of increasing printing resolution at few printing passes.

It is well-known in the art of inkjet printers to have ejectors in adjacent blocks to be offset and adjacent ejector units to be offset.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Morikawa to have ejectors in adjacent blocks to be offset by p x k and adjacent ejector units to be offset by p for the purpose of increasing resolution, since it has been held to be within the general skill of a worker in the art that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Morikawa in view of Anderson and further view of Bates to have and a cycle of the fluctuation is pxk, since it has been held to be within the general skill of a worker in the art that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 02/15/06 have been fully considered but they are not persuasive.

On page 8 of the arguments, the applicants argue that Bates fails to teach the large circles are disposed in a random fashion and that the sizes of dot diameters are changed at random. The examiner disagrees on both accounts. Bates clearly teaches, in figure 11, that the large circles are changed not in any particular pattern. For example, in row 1, the large circles are designated by numbers 1, 2, 3, and, 4; like wise, in the second row, the large circles are designated by numbers 5, 5, 7, and, 7, and in third row, the large circles are designated by 9, 10, 11, and 12, ... By this illustration, there isn't an established

pattern of where the large circles take place. Similarly, the same is true for where the sizes change. The applicants point out in figure 7, Bates teaches a repeating pattern. This is true, however the examiner likes to redirect the applicants back to figure 11 where the large dots, as well as, their sizes are changed randomly.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamson D. Nguyen whose telephone number is 571-272-2259. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Talbott can be reached on 571-272-1934. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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LAMSON NGUYEN
PRIMARY EXAMINER
04/19/06